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FILING DATE: *April 01, 2002*
RELATED PCT APPLICATION NUMBER: *PCT/US03/08114*

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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

INVENTOR(S)

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☐ *Additional inventors are being named on th____ separately numbered sheets attached hereto*

TITLE OF THE INVENTION (280 characters max)

FLEXIBLE CONTAINMENT CHARGING DEVICE

Direct all correspondence to: **CORRESPONDENCE ADDRESS**

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ENCLOSED APPLICATION PARTS *(check all that apply)*

☒ Specification *Number of Pages*	2	☐ CD(s), Number	
☒ Drawing(s) *Number of Sheets*	3	☐ Other (specify)	
☒ Application Data Sheet. See 37 CFR 1.76			

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The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.

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Respectfully submitted,

SIGNATURE

Date 04/01/02

TYPED or PRINTED NAME Thomas P. Pavelko

REGISTRATION NO. (*if appropriate*) 31,689

Docket Number: TPP 31446

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USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

This collection of information is required by 37 CFR 1.51. The information is used by the public to file (and by the PTO to process) a provisional application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the complete provisional application to the PTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Box Provisional Application, Assistant Commissioner for Patents, Washington, D.C.

P19LARGE/REV05

FLEXIBLE CONTAINMENT CHARGING DEVICE

Background of the Invention

The present invention relates to a film based material transfer device, with an integrated restraint system that protects the process operator and environment from the potent and or toxic substances contained within it.

Description of the Related Art

Potent compound, material transfer devices used in the pharmaceutical industry have typically been performed with rigid polymer bottles that can be integrated directly to a passive half of a split butterfly valve. These devices allow filling and/or discharging of potent substances in a contained manner when mated to the active half a split butterfly valve. The rigid polymer bottles can withstand limited pressurization during operation. These systems are known to present product flow problems when certain powder substances are used. Visual verification that the system has been completely emptied of potent product cannot be performed.

Another transfer device utilizes a film enclosure that integrates to a sanitary fitting. This fitting can be connected to a passive half of a split butterfly and used as above. These systems are used on a small product volume basis due to material strength. The transparent nature of the film allows visual verification that the potent substance has been discharged and the flexibility allows for manual manipulation of the system to enhance product flow out of the device. Use of this device in a pressurized environment can cause rupture of the film thus causing a breach in containment of the toxic substance.

Both of the above mentioned systems provide no means of grounding to eliminate any static electric charge that can build-up while filling or discharging the toxic substance. This can present a hazardous situation in solvent vapor environments.

Summary of the Invention

A process for integrating a flexible film based liner into a woven fabric restraint has been developed to transfer potent or toxic substances in a contained manner. The integration of the fabric restraint allows the system to withstand limited pressurization. The restraint not only adds strength to system while maintaining flexibility but also protects the liner from breach of containment due to puncture. The film liner is welded to a polymer sanitary fitting that can be integrated to a passive half of a split butterfly valve. The flexible nature of the device allows the operator to manually massage the potent powder substance to enhance flow characteristics when emptying the device. The restraint can be fabricated of conductive or non-conductive material. If

constructed from conductive woven fabric this will allow grounding of the device to eliminate static charge build-up while filling or discharging.

Brief Description of the Drawings

Fig. 1 is a representation of the flexible film liner assembly that forms the inner, containment layer of the charging device.

Fig. 2 is a representation of the woven fabric restraint assembled with the film liner. This provides both a pressure retaining capability of the system and protection from damage.

Fig. 3 is a section detail along lines A-A of fig. 2 illustrating the stitched integration of the film liner to the restraint along with the lifting loop.

Detail Description of the Preferred Embodiments

The flexible, charging device utilizes an inner liner 10 of Fig. 1 that is fabricated from a thin impermeable film of polymer material. This liner shape is constructed from patterns that are thermally welded together 11. The liner 10 is also thermally welded to the sanitary fitting 12. This assures a totally sealed fabrication that eliminates crevices where toxic substance can get trapped.

As shown in Fig. 2 & 3, the film liner 10 is integrated to a fabric restraint 13. The woven fabric restraint 13 has a clear polymer window 18 integrated into the side to allow the user to verify that all the contained substance has been emptied from the device. This window 13 is sewn over an opening in the fabric restraint material. The flexible film liner 10 is placed inside the fabric restraint 13 and mechanically attached by stitching 15 through both the restraint hem 14 and the welded seam 16 at the top of the device. Integration of the film liner 10 to the restraint 13 will assure that the liner remains in place and prevent the liner from collapsing and hampering product discharge. The stitching of the liner only occurs in the welded seam and will not breach the containment of the toxic substance. A lifting loop 17 is also captured in the stitching at the top of the device. This gives the user a means of suspending the device during unloading. As mentioned previously, the woven fabric may be constructed of conductive material. If a conductive fabric restraint is used a grounding loop 19 will be sewn into the restraint seam forming a path to ground.

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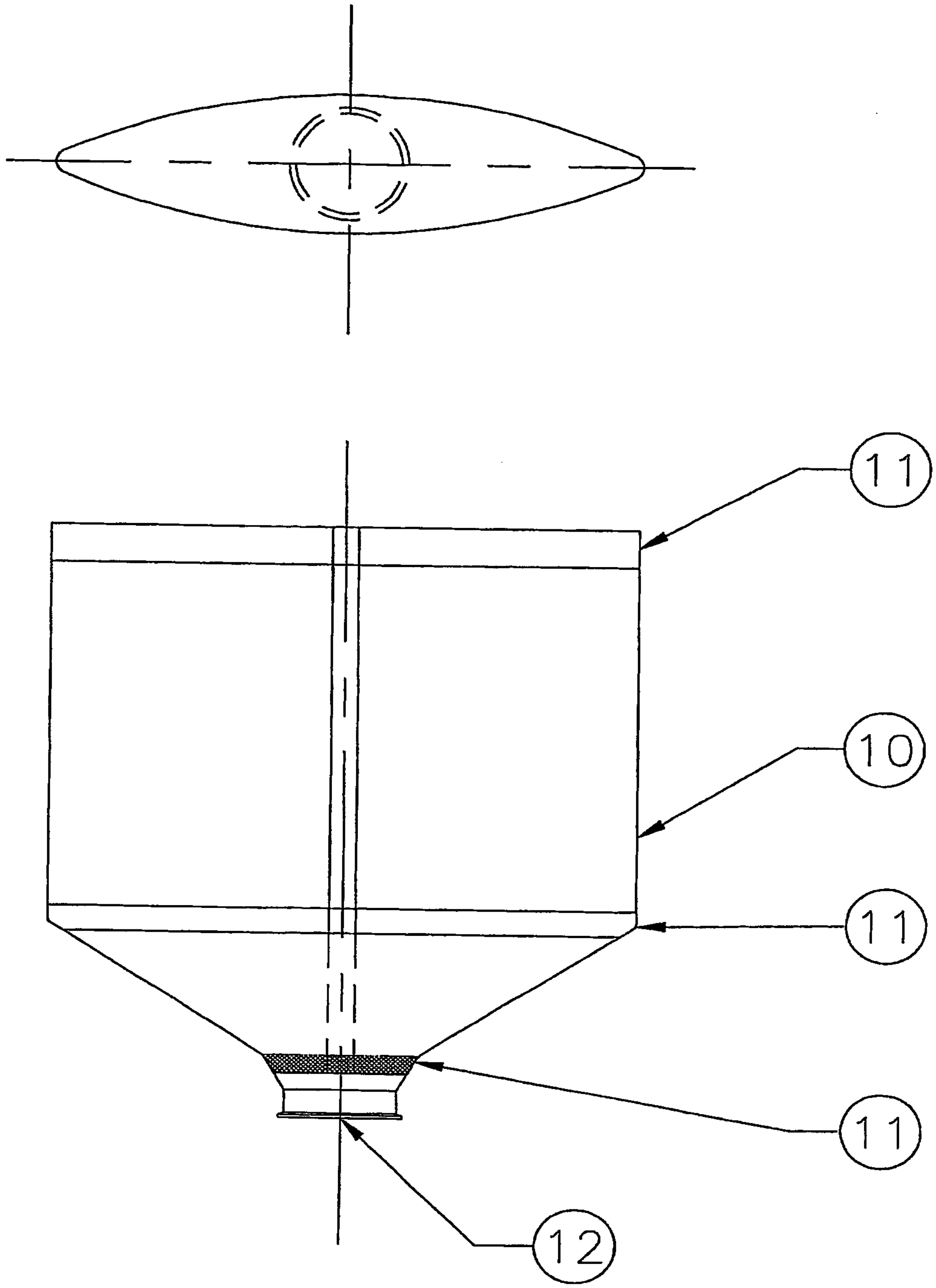


FIGURE 1

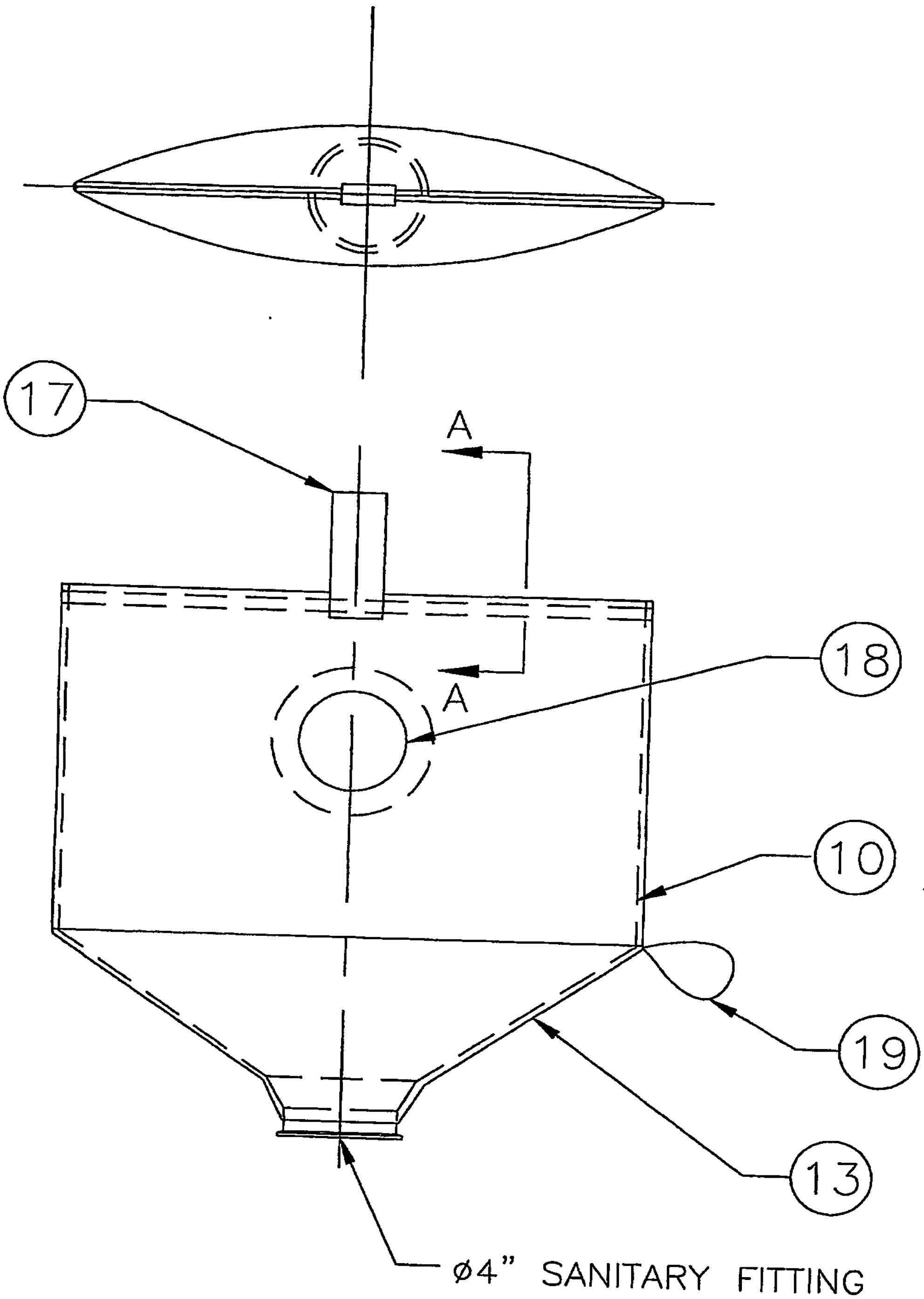
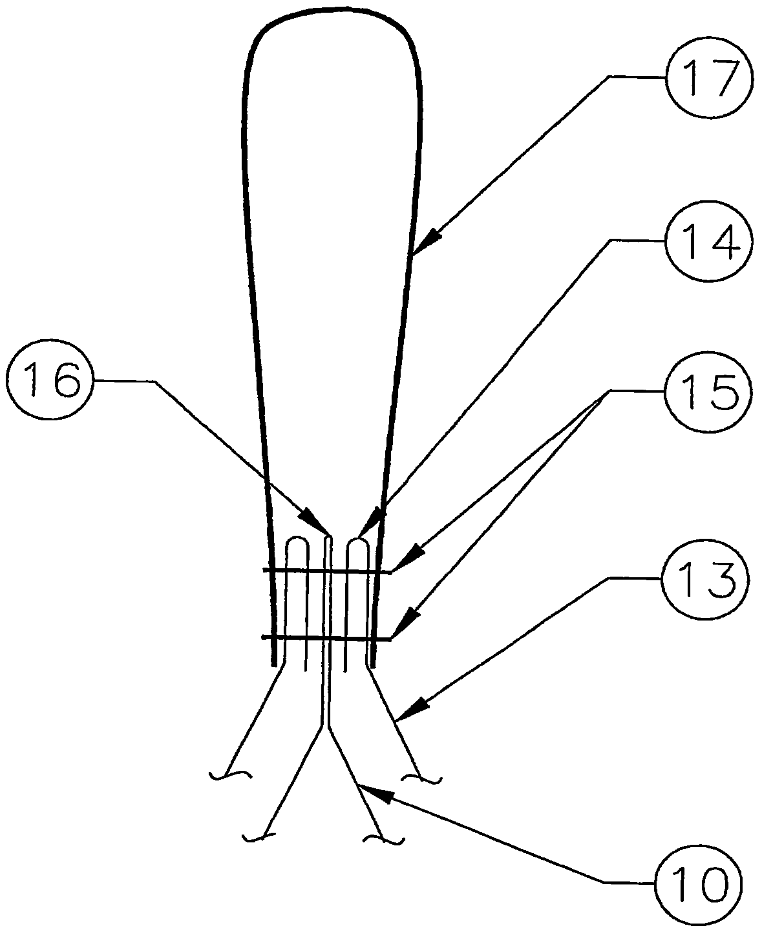


FIGURE 2



SECTION A–A

FIGURE 3

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Application deficiencies found during scanning:

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